



Using FutureCasting Methodologies in the NDI

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GSBA 556
Business Development in the
Networked Digital Industry (NDI)



Outline

1. Scanning the Periphery

2. Scenario Construction

3. CTM Firecracker Methodology



Defining the Scope

The biggest dangers to a company are the ones you don't see coming.

Understanding these threats – and anticipating opportunities – requires strong peripheral vision.

Companies in complex, rapidly changing environments require well-developed peripheral vision; those in relatively simple, stable environments have less of a need.



Scanning the Periphery

Asking the Right Questions



Learning from the Past

- What were the blind spots?
- Analogy to another industry?
- Who in the industry is skilled at picking up weak signals?

Examining the Present

- What important signals are being rationalized away?
- What are mavericks/outliers telling you?
- What are peripheral customers and competitors thinking?

Envisioning the New Future

- What future surprises could really hurt?
- What emerging technologies could change the game?
- Is there an unthinkable scenario?



Scenario Planning



Scanning the Periphery

Companies in complex, rapidly changing environments require well-developed peripheral vision; those in relatively simple, stable environments have less of a need.

1. Nature of Your Strategy
2. Complexity of Your Environment
3. Volatility of Your Environment
4. Your Leadership Orientation
5. Your Knowledge Management System
6. Your Strategy Making
7. Your Organizational Configuration
8. Your Culture

Assessing
Need

Assessing
Capabilities



Scanning the Periphery



Nature of Strategy

Focus of strategy	1	2	3	4	5	6	7
Growth orientation	1	2	3	4	5	6	7
Number of business to integrate	1	2	3	4	5	6	7
Focus on reinvention	1	2	3	4	5	6	7

Complexity of the Environment

Industry Structure	1	2	3	4	5	6	7
Channel Structure	1	2	3	4	5	6	7
Market Structure	1	2	3	4	5	6	7
Enabling Technologies	1	2	3	4	5	6	7
Regulation	1	2	3	4	5	6	7
Public Visibility of Industry	1	2	3	4	5	6	7
Dependence on Government Funding	1	2	3	4	5	6	7
Dependence on Global Economy	1	2	3	4	5	6	7



Volatility of the Environment

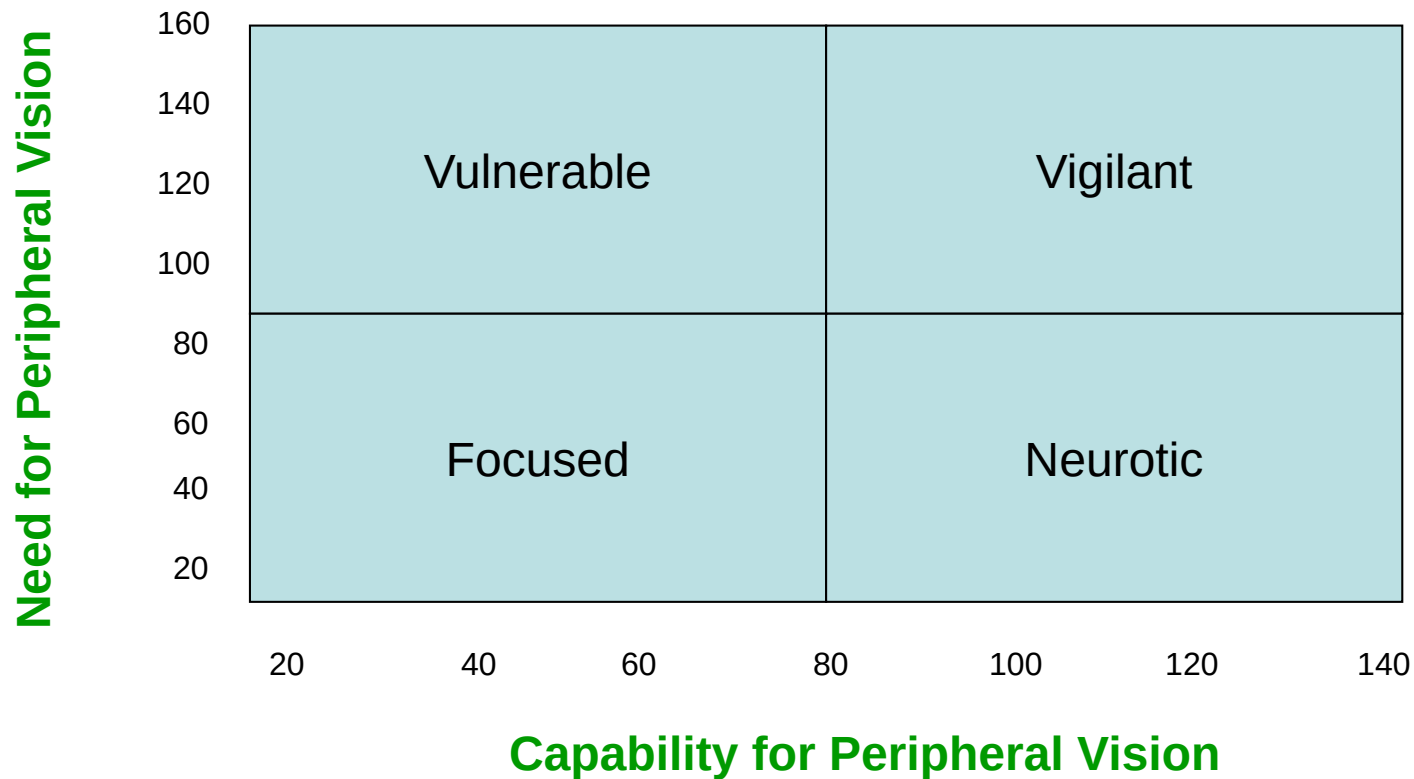
No. of Surprises by High-Impact Events	1	2	3	4	5	6	7
Accuracy of past forecasts	1	2	3	4	5	6	7
Market Growth	1	2	3	4	5	6	7
Growth Opportunities	1	2	3	4	5	6	7
Speed & direction of technological change	1	2	3	4	5	6	7
Behavior of competitors/suppliers	1	2	3	4	5	6	7
Posture of key rivals	1	2	3	4	5	6	7
Susceptibility to macroeconomic forces	1	2	3	4	5	6	7
Dependence on financial markets	1	2	3	4	5	6	7
Customer and channel power	1	2	3	4	5	6	7
Sensitivity to social changes	1	2	3	4	5	6	7
Potential for major disruption in next 5 yrs.	1	2	3	4	5	6	7



Scanning the Periphery



Score





Scanning the Periphery

Scanning your Company

“Scanning the Periphery” in HBR, Nov. 2005. It describes a systematic method for where to look and how to interpret weak signals in the environment that warn of impending changes, threats, and opportunities. Then, pick a company in the NDI that you know or have worked at, and score it by responding (you can guess..) to the survey in the article (both the need for peripheral vision, and the capability for peripheral version) and then compute the score and determine whether the company is focused, vulnerable, neurotic, or vigilant. Which type do you think is most common ? Please come prepared to discuss.



Scenario Planning



- Disciplined method for imagining possible futures
- Simplifies data into limited number of possible states
- Explores the impact of various uncertainties and considers change in several variables simultaneously.
- Attempts to identify patterns and clusters among potentially large number of possible outcomes.



Scenario Planning



When is it Beneficial

- Uncertainty is high relative to manager's ability to adjust.
- Too many costly surprises have occurred in past.
- Company does not perceive or generate new opportunities.
- Quality of strategic planning is low.
- Industry has experienced significant change or is about to.
- Company wants a common language and framework without stifling diversity.
- Strong Differences of Opinion.



Scenario Planning

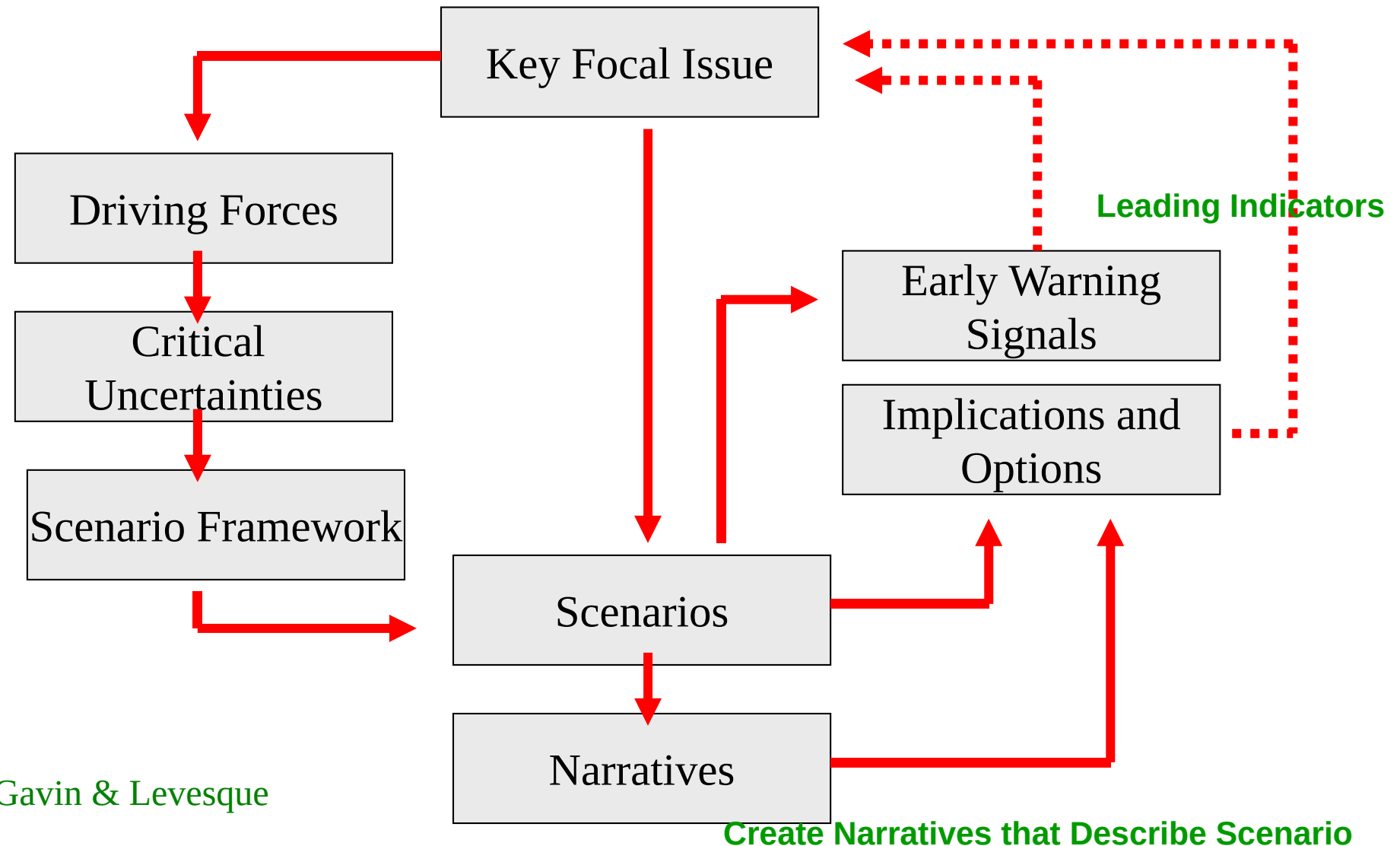


Steps in Scenario Construction

1. Define the Scope.
2. Identify Major Stakeholders.
3. Identify Basic Trends
4. Identify Key Uncertainties
5. Construct Initial Scenario Themes
6. Check for Consistency and Plausibility
7. Develop Learning Scenarios.
8. Identify Research Needs
9. Develop Quantitative Models.
10. Evolve towards Decision Scenarios.

Scenario Planning (2005)

Steps in Scenario Construction





Using FutureCasting Methodologies in the NDI:

CTM's Firecracker Approach



Future-Casting

Key Differentiators

TRADITIONAL SCENARIOS	CTM FUTURECAST SCENARIO
Generally approaches only from either a “Technology-Push” or “Demand-Pull” Perspective	Incorporates both “Technology-Push” and “Demand-Pull” approaches and allows scenarios to be created from both perspectives
Technology is seen as driver	Applications that technologies enable are seen as drivers
Evaluates the effect of individual factors on how the scenarios will change in response to changes in individual drivers	Evaluates drivers in terms of their “potential tension” with other drivers and projects the outcomes of these
Usually provides for “global” scenarios and not in the context of specific technological applications	Permits development of “localized scenarios” based on specific applications or geographical space
Usually does not interpose framework on past realized scenarios	Allows for analyses for realized scenarios and how specified “tension-points” have played out

Future-Casting

Iterative Process

Provides Unique Lens to view alternative scenarios

Applications form the context and industry drivers are evaluated in terms of their potential “tensions” with other forces. Resolution of these “tension points” ultimately determine the scenarios

Generates Localized and Global Scenarios for specific applications

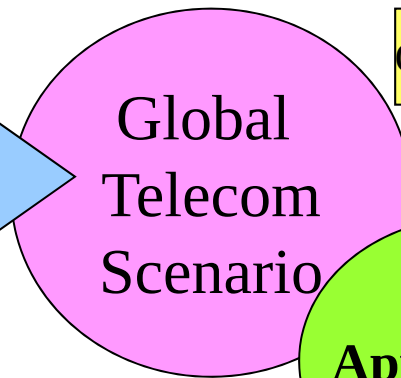
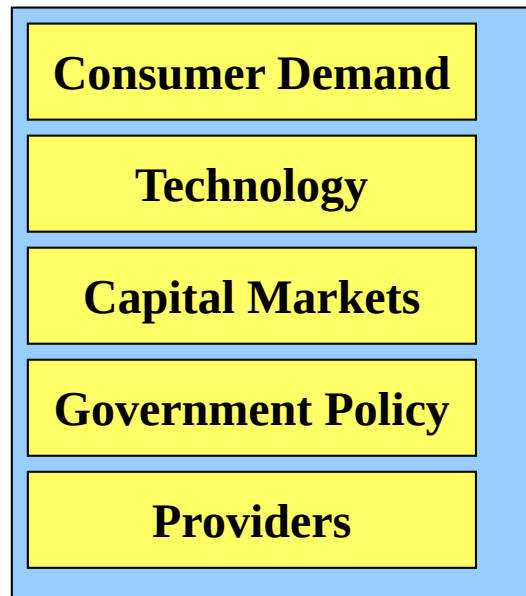


Firecracker Approach

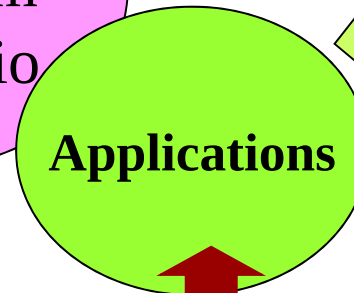
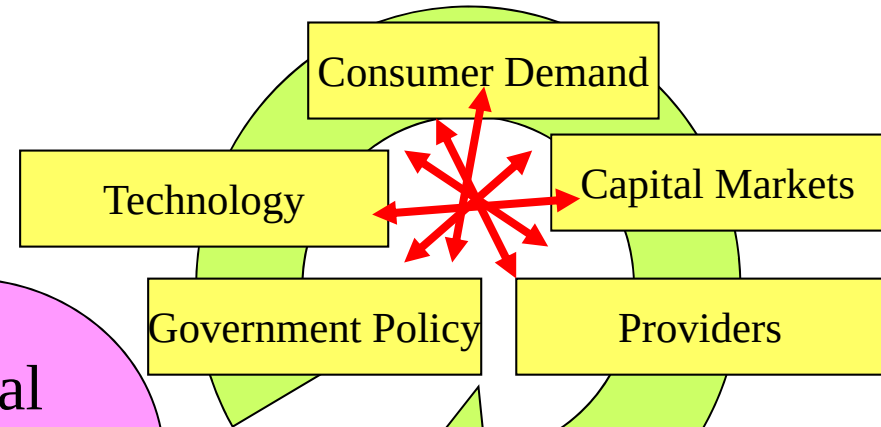
Future-Casting



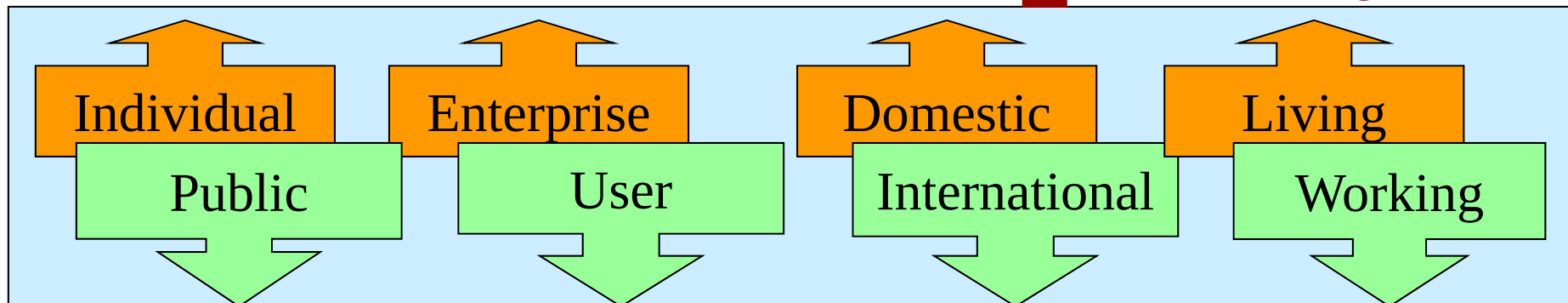
Traditional



CTM

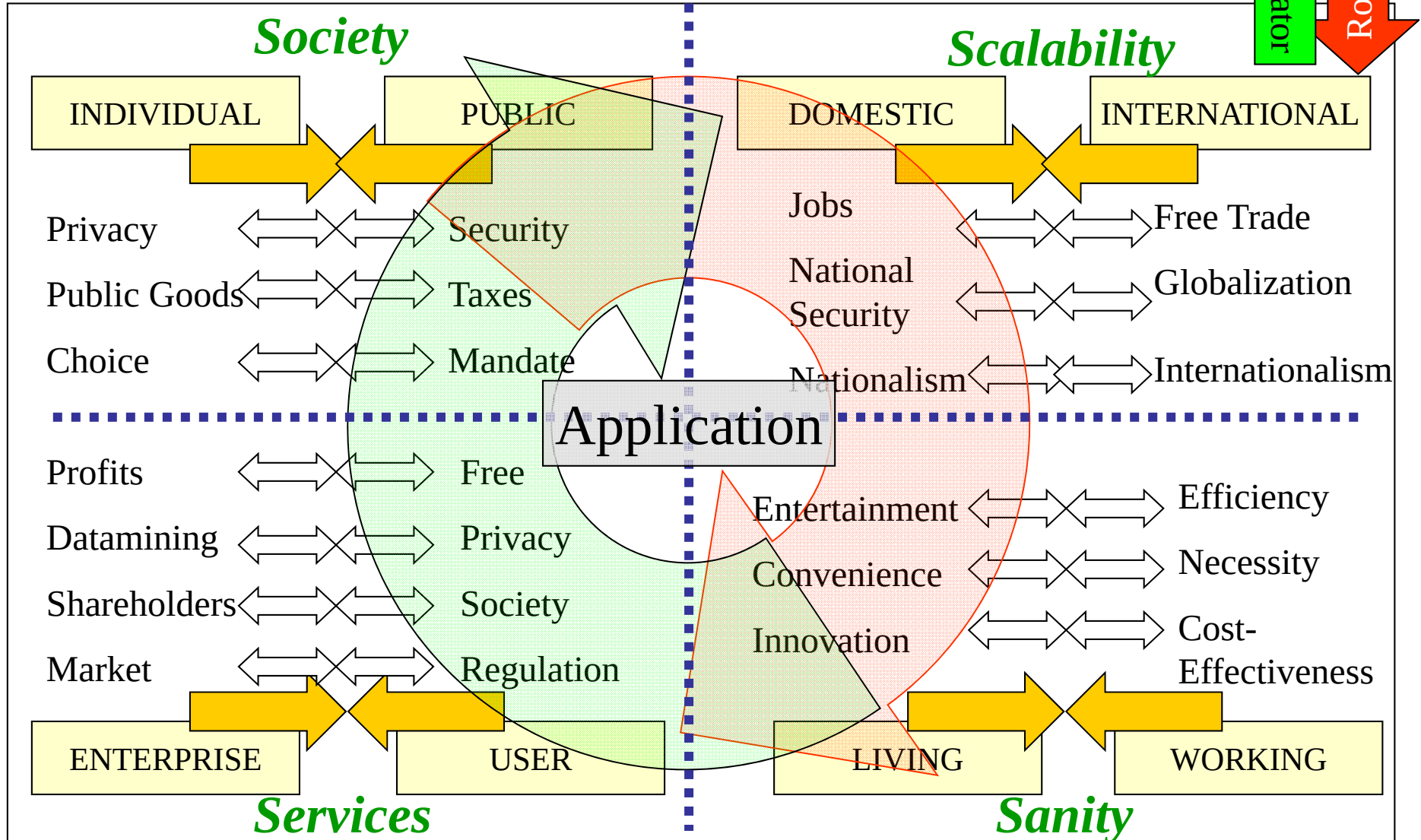


**CTM's
Tension Point
Categories**



Identifying Key Issues

Tension Point Categories



Degree of Importance

	Weight	Total
Scope of Issue		
Social Impact		
Level of government Mandate		
Legal protection		
Saliency of Issue		
Recurrence of Issue		
TOR Experts' Analysis		
CTM Independent Analysis		

Very Important:
> 80

Not Important:
< 10

1 2 3 4 5 6 7 8 9 10

Low

High

Probability of Resolution

Tension

Category

	WEIGHT	TOTAL
INDICATOR 1		
INDICATOR 2		
INDICATOR 3		
INDICATOR 4		
INDICATOR 5		
INDICATOR 6		
INDICATOR 7		
INDICATOR N		
MAXIMUM TOTAL		

Most Definitely: > 24

Most Unlikely: < 10

Significant Negative Change

-3
-2
-2
0
1
2
3

Significant Positive Change



Tracking Tension Points



High

Probability of Resolution

GOOD
SAMARITAN

CHAMPAGNE &
CAVIAR

IGNORANCE
IS BLISS

Watch this Space

HEARTACHES &
HEARTBREAKS

Low

Level of Importance

Switched Voice

Law enforcing authorities are pressing for measures to allow for tracking with VoIP

Corporate Outsourcing of call centers is increasing political pressures to retain jobs domestically

	PUBLIC		DOMESTIC		INTERNATIONAL	
Privacy			National Security			Free-Trade
Universal Service			Taxes			Globalization
Choice			Mandate			Internationalism
ENTERPRISE	USER		LIVING		WORKING	
Profits			Free			Efficiency
Data-Mining			Privacy			Necessity
Share-Holders			Society			Cost-Effectiveness
Market			Regulation			

Globalization is pressuring international arbitrage rates to reflect market rates

Residential and business users expect high quality, reliable and high speed communication services

PSTN may not be able to support new multimedia corporate applications

Tele-Working is on the Rise

FCC requires reliable voice quality network that provides E911 and universal service requirements

Accelerating

No Change

Decelerating

Accelerator

Road-Block

FutureCasting IMMS

Need for new programming that includes interactive

No current indication of Issues related to this domain

INDIVIDUAL		PUBLIC		DOMESTIC		INTERNATIONAL	
Privacy			National Security	Jobs			Free-Trade
Universal Service			Taxes	National Security			Globalization
Choice			Mandate	Nationalism			Internationalism
ENTERPRISE		USER		LIVING		WORKING	
Profits			Free	Entertainment			Efficiency
Data-Mining			Privacy	Convenience			Necessity
Share-Holders			Society	Innovation			Cost-Effectiveness
Market			Regulation				

Accelerator
Road-Block

Requires compelling content to motivate consumer to switch from “passive” to “interactive” multi-media services

DRM issues may retard end-user adoption of “Interactive” Multimedia Services

Ease of transferring content across multiple devices, as well issues of interoperability across devices are crucial



Applying CTM's Firecracker Methodology: Digital Home Health



Focus



Identifying the accelerators and obstacles to the adoption of Remote Digital Home Healthcare and Health Monitoring applications.

1. What are the key tension points that may retard end user adoption of these applications, including machine-to-machine communications?
2. Are there technological issues related to access (both wireless and wireline) and delivery?
3. What are the key accelerators and roadblocks for health care service providers, insurance companies and network operators?
4. What are the regulatory trends and possible outcomes for this application?



Introduction

- Current total health-care spending in the U.S amounts to US\$2 Trillion
- Health-care spending estimated to reach US\$4 Trillion by 2010
- Declining number of qualified nurses and doctors
- Digital home-health (and telemedicine) provides a solution to escalating costs, specifically to early detection and health maintenance.



Digital Home-Health

Definition



Telemedicine: Use of telecommunications and computer technologies with medical expertise to facilitate health-care delivery.

Digital Home Health:
Incorporates remote sensing, collaborative patient care and access to electronic libraries and medical databases.

CyberMedicine: Science of applying Internet and global networking technologies to medicine and public health, of studying the impact of Internet, and evaluating opportunities and challenges for health care.



Digital Home-Health Services



Specialist referral Services

Patient seeing a specialist over live, remote consult or transmission of diagnostic images and/or video to specialist

Direct patient care

Sharing of audio, video and medical data between patient and health professional for diagnosis, treatment plan or advice

Remote patient monitoring

Devices to remotely collect and send data to a monitoring station for interpretation. Applications include telemetry devices to capture blood pressure, glucose, vital signs

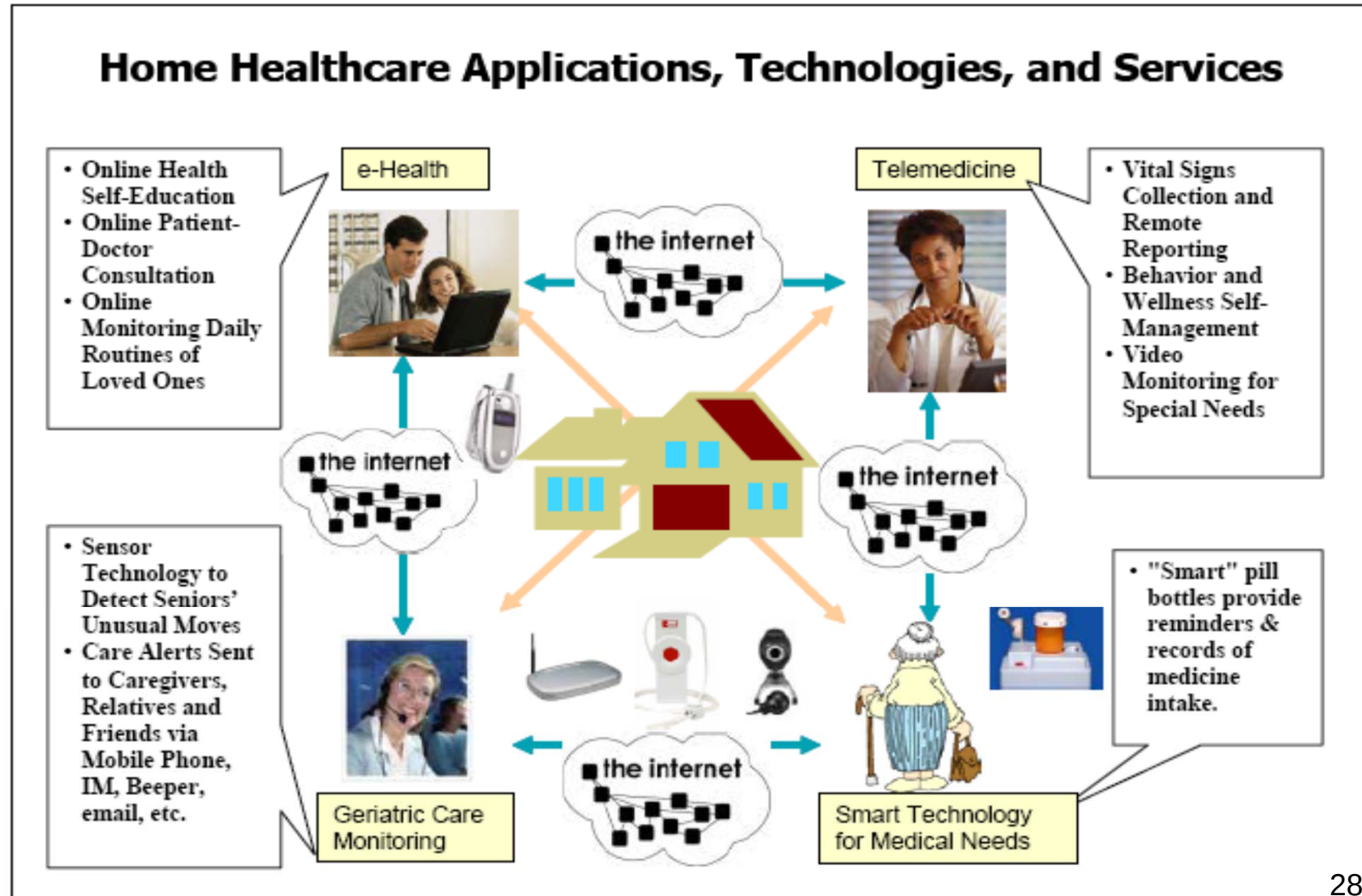
Medical education and mentoring

Provision of continuing medical education credits for health professionals and special medical education

Consumer medical and health information

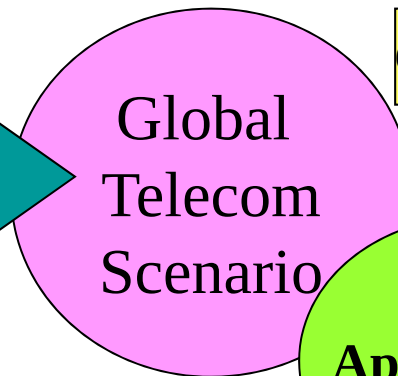
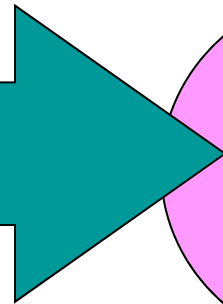
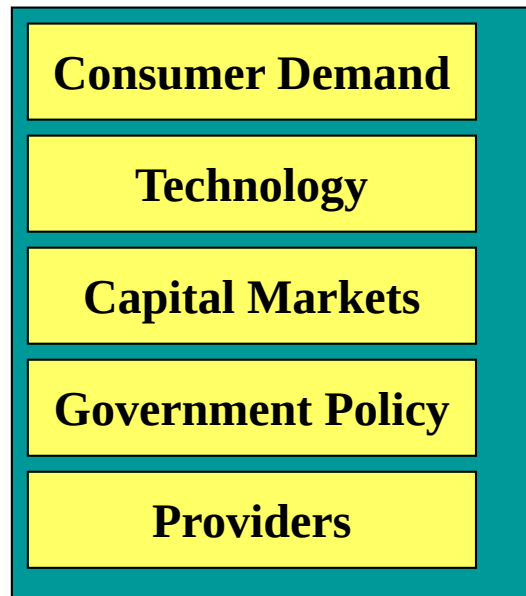
Use of internet for consumers to obtain specialized health information and on-line²⁷ discussion groups for peer-to-peer support

Remote Digital Home Health Definition

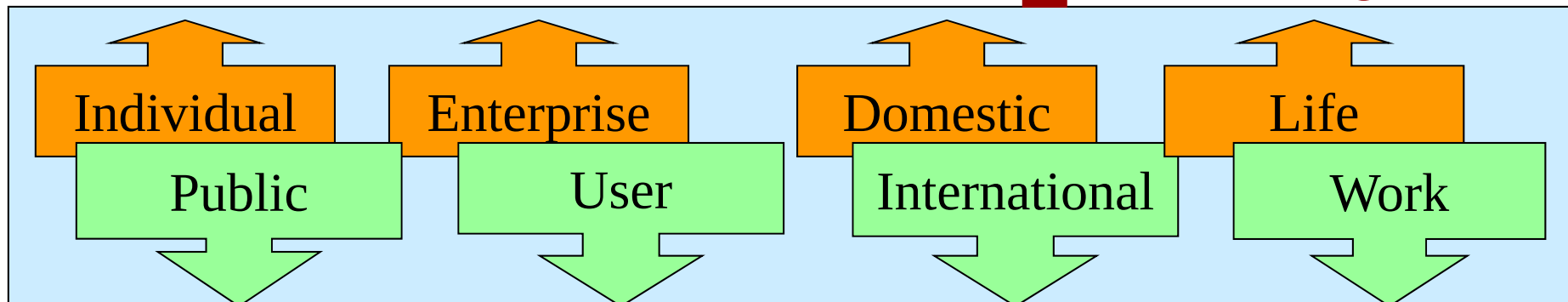
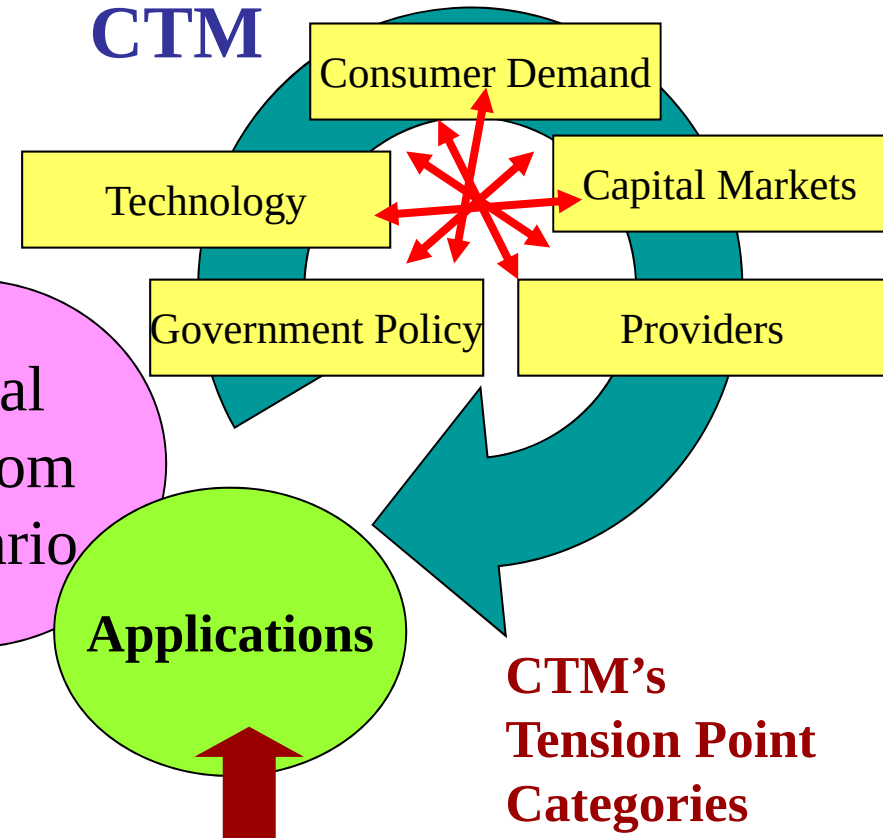


“Firecracker” Approach

Traditional

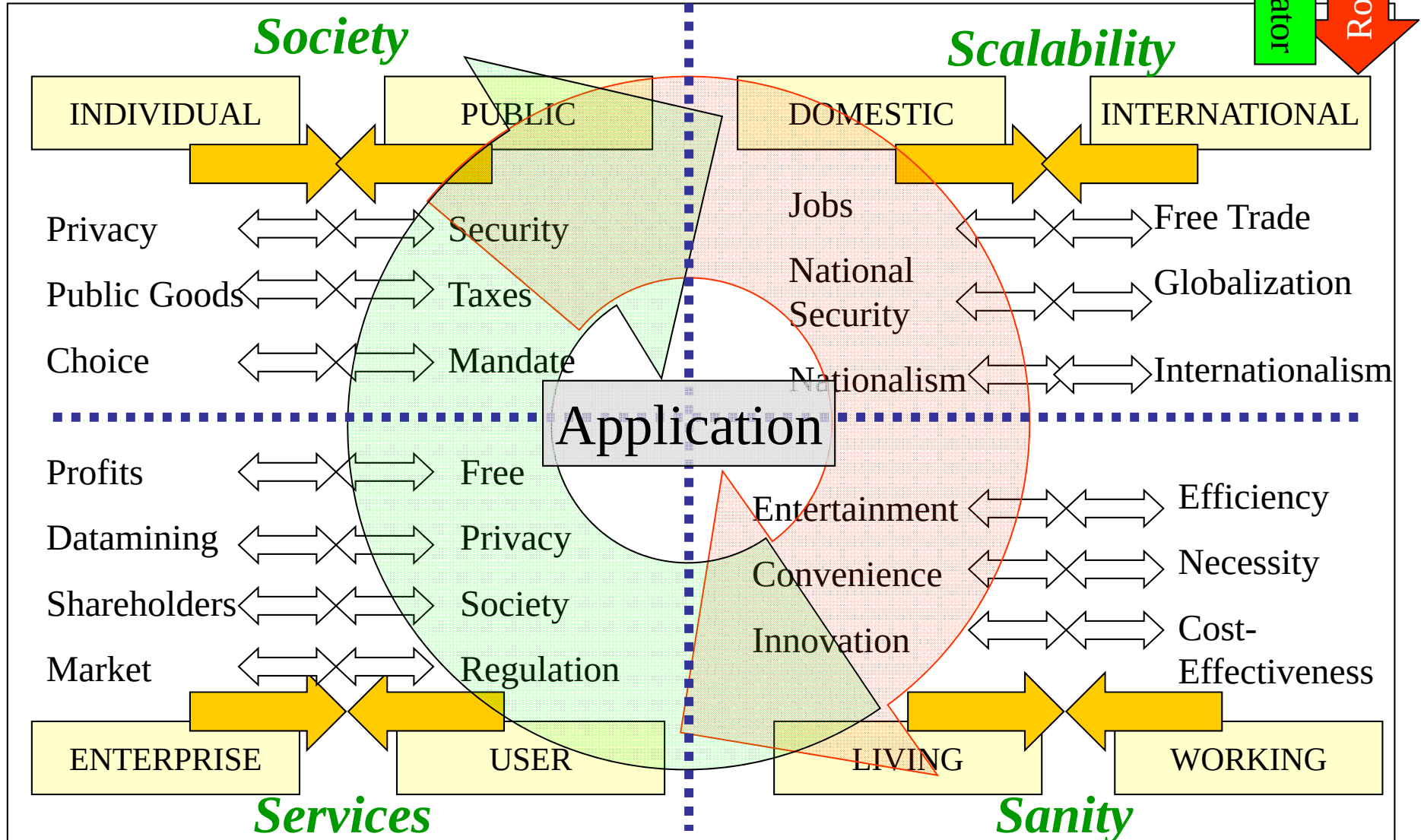


CTM



Identifying Key Issues

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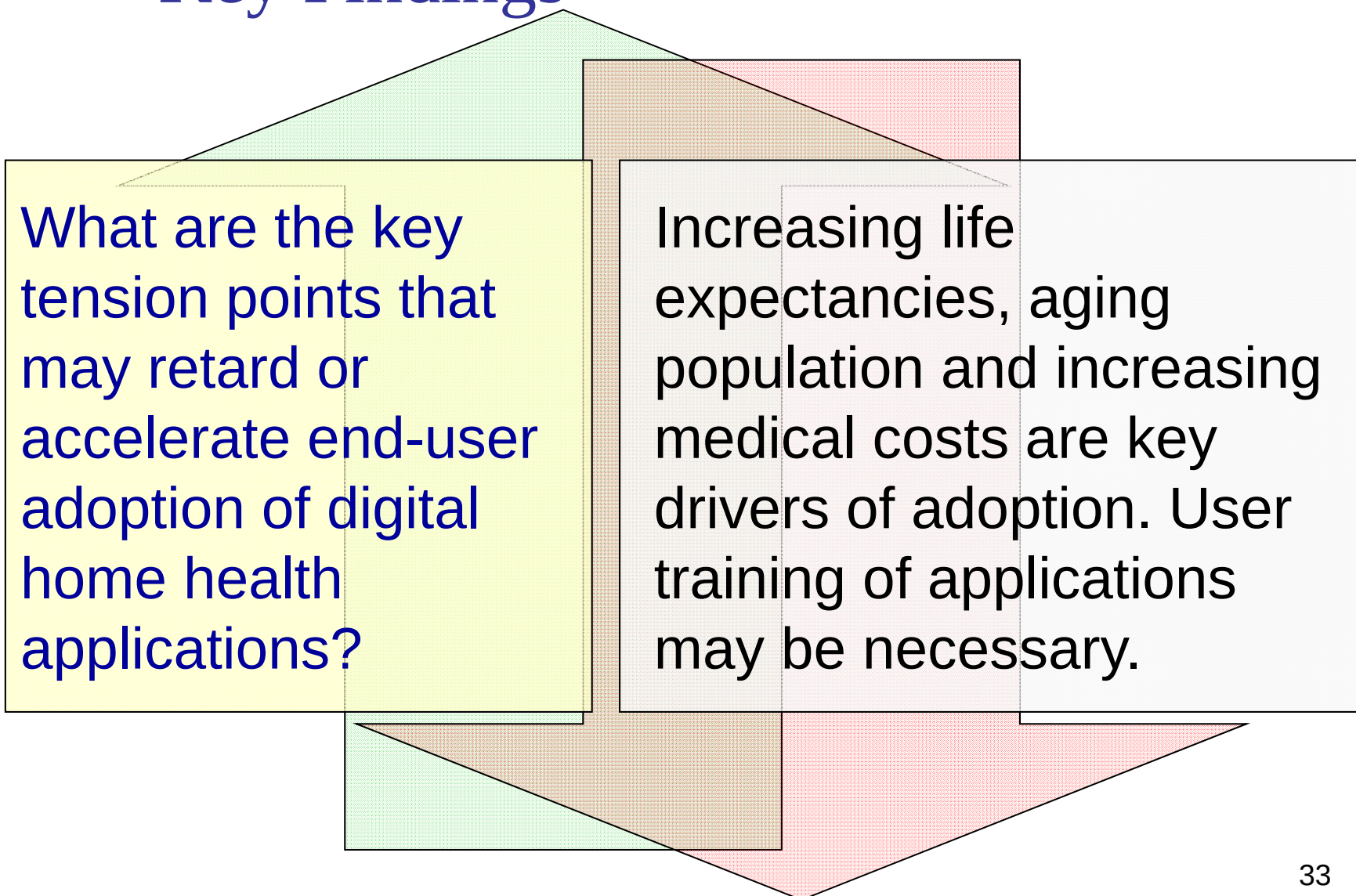
Watch this Space

**HEARTACHES &
HEARTBREAKS**

Low

Level of Importance

Key Findings



What are the key tension points that may retard or accelerate end-user adoption of digital home health applications?

Increasing life expectancies, aging population and increasing medical costs are key drivers of adoption. User training of applications may be necessary.



Digital Home-Health



Innovation vs. Cost Effectiveness

- Increase in life expectancy and rapid growth of elderly population. Each additional year of life increases health care costs by 3%.
- End-user surveys suggest cost and time savings from reduced hospital admissions, emergency department and medical practitioner visits and reduced travel costs.
- Digital home-health is not seen by end-users as means to replace “physician-patient” contact. Applications designed to support and enhance “face-to-face” contact have yet to be fully developed
- Estimated that over 25% of all material accessed on the net is health-related



Digital Home-Health



Convenience vs. Necessity

- Enables monitoring of indicators of human health condition, such as blood pressure.
 - Hypertension tends to lead to coronary heart disease, apoplexy and nephropathy. 45% of hypertension patients die from cardiovascular disease
 - Hypertension patients are 8 times higher than normal people to get apoplexy.
- Allows “aging in place.”
 - *95% of older adults surveyed prefer to live in their own homes as long as possible*



Digital Home-Health



Entertainment vs. Efficiency

DEMOGRAPHIC GROUP	Percentage Who Have Looked for Health Information Online
Online women	82
Online men	77
Internet users age 18 to 29	79
Internet users age 30 to 49	84
Internet users age 50 to 64	78
Internet users age 65 and older	68
Internet users with high school diploma or less	71
Internet users with some college education	80
Internet users with a college degree	89
Internet users with 2 to 3 years of online experience	62
Internet users with 6 or more years of online experience	86
Internet users with a dial-up connection at home	75
Internet users with a broadband connection at home	86

25% of Information on Internet is Health Related

Source: Pew Internet and American Life Project, 2006

Digital Home-Health

Entertainment vs. Efficiency



Example of Home Telecare Unit: computer screen with clinical measurement unit underneath, and various peripherals for physiological recordings, such as wireless weight scale, single lead electrocardiogram, blood pressure cuff, spirometer and pulse oximeter.

“Computer Anxiety: Surveys and focus groups studies suggest anxiety on part of some patients in using the equipment. Training could eliminate some of the anxiety



Digital Home-Health



Entertainment vs. Efficiency

- 34 Million Adults in the U.S. Live with a Disability or Chronic Disease
- 51% of Adults with Chronic Disease Go Online
- Chronic Diseases account for 75% of Health Care Spending

Illness Categories	Device or Peripherals
Cardiology, such as hypertension, CHF and stroke	Blood pressure monitor, weight scale, digital electronic stethoscope
Respiratory disease, such as asthma, and COPD	Peak flow meter, monitor, weight scale, digital stethoscope, digital spirometer
Diabetes and wellness	Blood glucose monitor, weight scale
Post-acute recovery, such as wound care, post-surgical and organ transplant	Video camera or image-capturing devices
Mental health, such as chronic depression and schizophrenia	Video camera for live interactive sessions

38



Digital Home-Health



Entertainment vs. Efficiency

HEALTH TOPICS	Percentage of Internet Users Who Searched for Information		
	With disability/ chronic condition	With no chronic conditions	All
Specific disease or medical problem	73	62	64
Certain medical treatment or procedure	64	49	51
Diet, nutrition, vitamins or nutritional supplements	53	48	49
Exercise or fitness	46	44	44
Prescription or over-the-counter drugs	51	35	37
A particular doctor or hospital	33	28	29
Health insurance	30	28	28
Alternative treatments or medicines	42	25	27
Depression, anxiety, stress or medical health issues	30	21	22
Environmental health hazards	24	21	22
Experimental treatments or medicines	30	17	18
Immunization or vaccinations	13	16	16
Dental health information	10	14	11
Medicare or Medicaid	21	11	13
Sexual health information	11	11	11
How to quit smoking	18	8	9

E-patients with chronic condition are likely to use their online health research to aid care decisions, ask new questions of their doctors and manage chronic conditions

Source: Pew Internet and American Life Project, 2007



Digital Home-Health



Entertainment vs. Efficiency

HEALTH TOPICS	Percentage of Internet Users Who Searched for Information		
	2002	2004	2006
Specific disease or medical problem	63	66	64
Certain medical treatment or procedure	47	51	51
Diet, nutrition, vitamins or nutritional supplements	44	51	49
Exercise or fitness	36	42	44
Prescription or over-the-counter drugs	34	40	37
A particular doctor or hospital	21	28	29
Health insurance	25	31	28
Alternative treatments or medicines	28	30	27
Depression, anxiety, stress or medical health issues	21	23	22
Environmental health hazards	17	18	22
Experimental treatments or medicines	18	23	18
Immunization or vaccinations	13	16	16
Dental health information	*	*	15
Medicare or Medicaid	9	11	13
Sexual health information	10	11	11
How to quit smoking	6	7	9
Problems with drug or alcohol	8	8	8

Source: Pew Internet and American Life Project, 2006



Digital Home-Health

Entertainment vs. Efficiency



- 75% of e-patients with chronic conditions report information they found in their last search affected a decision about how to treat an illness or condition compared with 55% of e-patients with no chronic conditions
- 69% report information led them to ask a doctor new questions or to get a second opinion from another doctor compared with 52% of e-patients with no chronic conditions
- 57% report the information changed the way they cope with a chronic condition or manage pain, compared with 36% of e-patients with no chronic conditions.
- 56% report the information changed the way they think about diet, exercise, or stress management, compared with 42% of e-patients with chronic conditions.
- 61% report information changed their overall approach to maintaining their health or the health of someone they take care of, compared with 54% of e-patients with no chronic conditions.
- 36% report the information affected a decision about whether to see a doctor, compared with 35% of e-patients with no chronic conditions.



Digital Home-Health



Entertainment vs. Efficiency

DEMOGRAPHIC GROUP	Health Seekers (%)	Internet Population(%)	U.S. Population(%)
Women	54	52	53
Men	46	48	47
Age 18 to 29	23	24	19
Age 30 to 49	45	43	37
Age 50 to 64	23	24	24
Age 65 and older	6	8	17
Less than high school education	5	5	12
High school diploma	28	28	33
Some college education	27	27	23
College degree or more	40	35	28
Less than 2 years of online experience	3	4	3
2 to 3 years of online experience	7	9	6
4 to 5 years of online experience	16	18	12
6 or more years of online experience	72	66	46
Dial-up connection at home	23	25	17
Broadband connection at home	66	51	43

Mixed indications that older patients are less likely to use digital home health applications. 42

Digital Home-Health

Entertainment vs. Efficiency

YouTube: How to use an Inhaler



Inhaler Technique

Added July 23, 2006
From [BulthSurgery](#)

DESCRIPTION:
Asthma is a common condition that can cause variable and intermittent symptoms such as cough, wheezing and breathlessness. Chronic Bronchitis is similar but usually related to smoking. In both conditions, inhaled medication can be effective in controlling symptoms. This medication is given by pumps or inhalers. Their effectiveness relies on good user technique. In this episode we show how to correctly use a common type asthma pump, or metered dose inhaler.

Bulth and Llanwrtyd Medical Practice has made every effort to ensure that the information in these episodes is accurate, up to date, and as helpful as possible. However we will not be responsible for any inaccuracies or omissions. In particular if you are unwell, it is important that you do not rely on information from the Internet - you should seek professional medical advice from your Doctor. If your condition is getting worse, or if you are seriously ill, you should call or visit your Surgery. [\(less\)](#)

Category: [Howto & DIY](#)

Tags: [Asthma](#) [inhaler](#) [wheeze](#) [doctor](#) [\(more\)](#)

URL: <http://www.youtube.com/watch?v=51Zjwcx7Zb>

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Views: 3,965 | Comments: 0 | Favorited: 19 times

Adding comments have been disabled for this video.

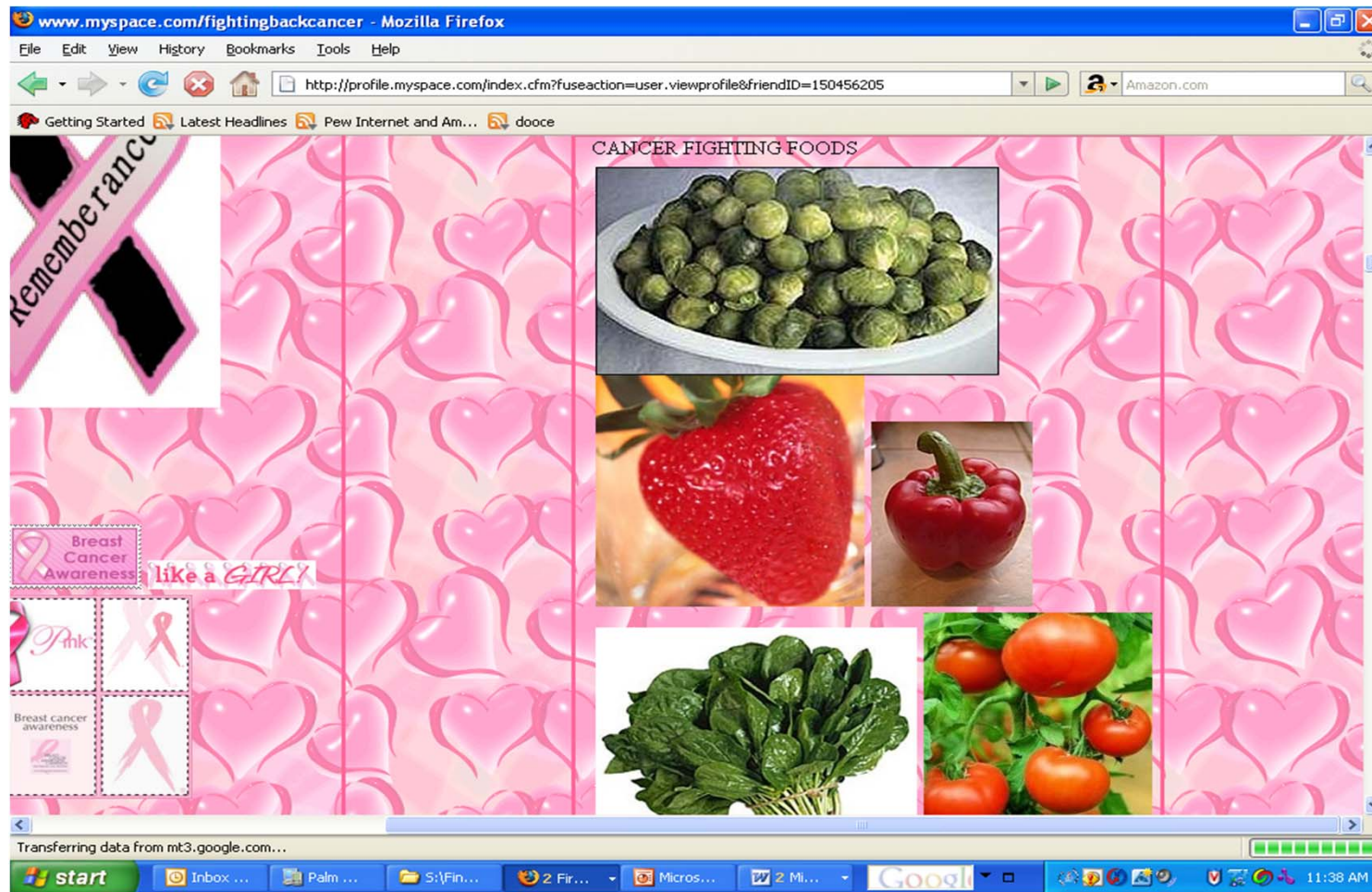
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Digital Home-Health

ctm
Leadership for the NETWORKED DIGITAL INDUSTRY

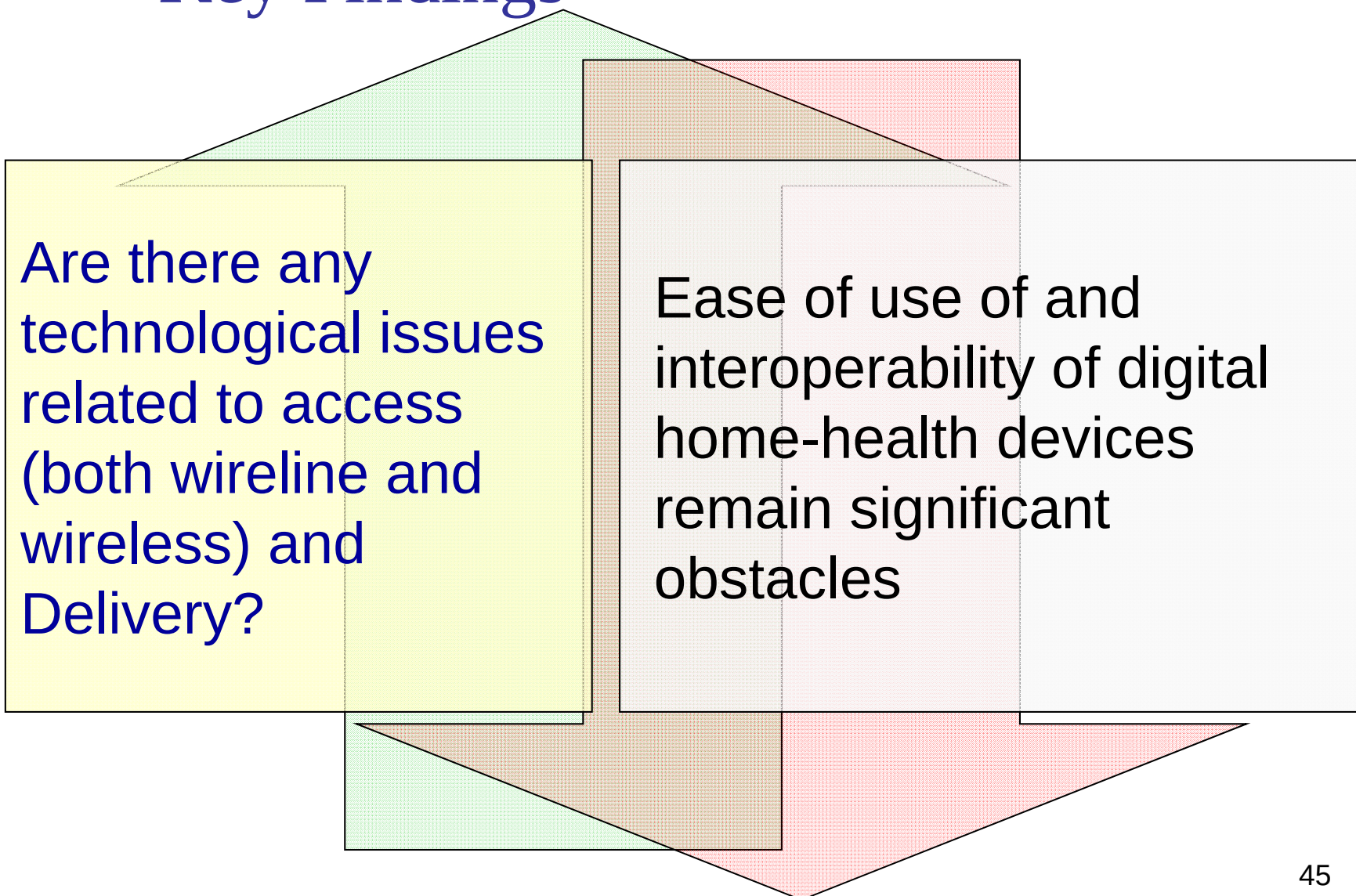
Entertainment vs. Efficiency

MySpace: Fighting Back Cancer



Source: Pew Internet and American Life Project, May 2007

Key Findings



Are there any technological issues related to access (both wireline and wireless) and Delivery?

Ease of use of and interoperability of digital home-health devices remain significant obstacles



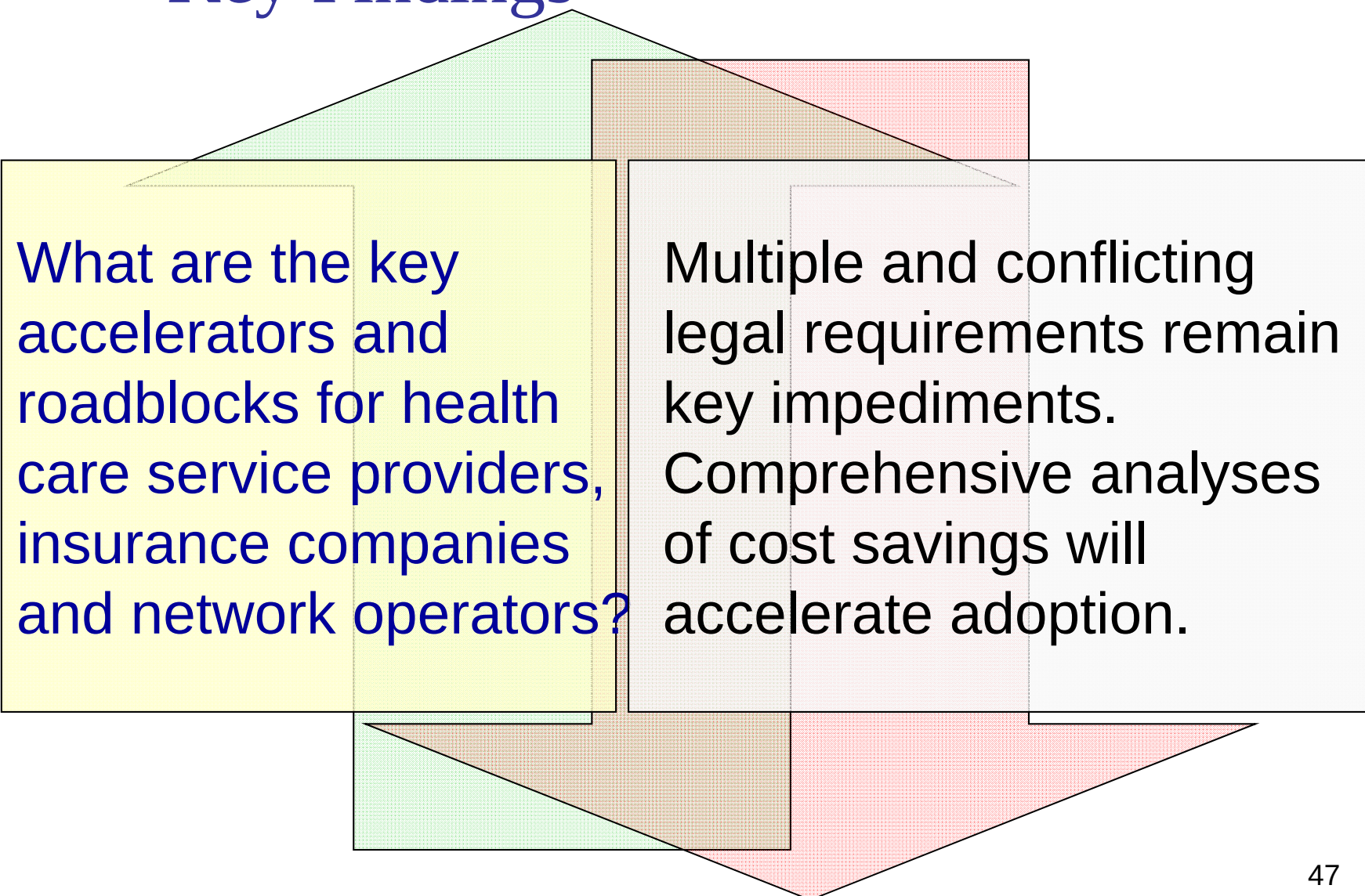
Digital Home-Health



Market vs. Regulation

- Standards remain key issues. Interoperability across software, devices using proprietary specifications and lack of agreed protocols and guideline still persist
- Ability for OEMs to scale up to meet potential demands of major health-care providers will be key hurdle (over 300 OEM produced some 100K units to date)
- Possible interference between devices caused by different transmission technologies – Bluetooth, WiMax etc.

Key Findings



What are the key accelerators and roadblocks for health care service providers, insurance companies and network operators?

Multiple and conflicting legal requirements remain key impediments. Comprehensive analyses of cost savings will accelerate adoption.



Digital Home-Health



Market vs. Regulation

- Health industry in U.S. is highly structured and extremely complex. Challenging to bring together consortium of health care providers, private and state insurance companies, and equipment providers
- HIPPA and privacy requirements pose potential impediments
- Tele-Health defined as “bringing doctor to the patient” as opposed to “patient to the doctor.”
- Possibility of interference between wireless devices



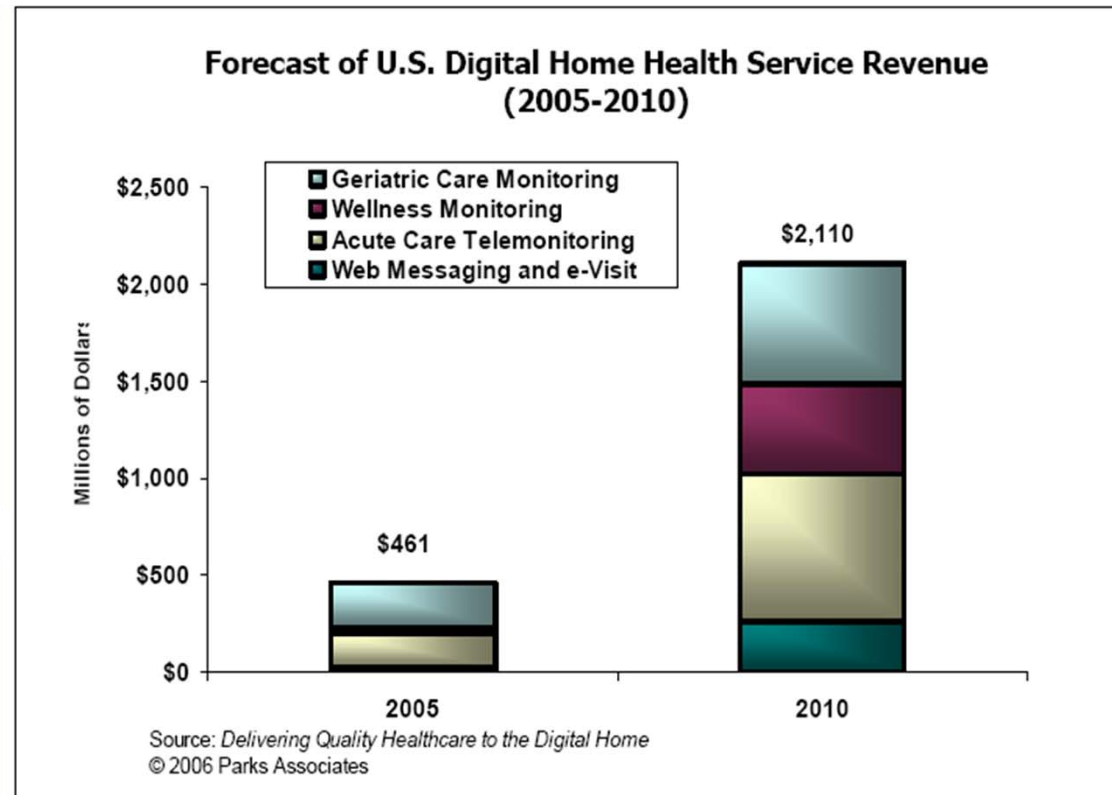
Digital Home-Health

Profits vs. Free



7.6 million patients with acute illness, permanent disability, terminal illness receive care from 17,700 providers.

Home health care expenditures of \$55 billion annually.





Digital Home-Health



Profits vs. Free

Cost of Inpatient Care (per patient per month) Compared to Home Care for Select Conditions			
Conditions	Hospital Costs	Home Care Costs	Dollar savings
Low birth weight	\$26,190	\$330	\$25,860
Ventilator-dependent adults	\$21,570	\$7,050	\$14,520
Oxygen-dependent children	\$12,090	\$5,250	\$6,840
Chemotherapy for children with cancer	\$68,870	\$55,950	\$13,920
Congestive heart failure in the elderly	\$1,758	\$1,605	\$153
Intravenous antibiotic therapy for cellulitis, Osteomyelitis, others	\$12,510	\$4,650	\$7,860

Source: National Association of Home Care & Hospice, 2007



Digital Home-Health



Profits vs. Free

Congestive Heart Failure

- 20% of Americans over 40 will develop CHF
- Leading cause of hospitalization/re-hospitalization
- Appropriate disease management is critical

Sentara Healthcare Cardiac Connection Program

ViTelCare Turtle: Home Monitoring System

Touch screen monitor allows patient to perform simple measurements such as blood pressure and weight, answer questions and information is electronically transmitted to home care nurse

Pre-Program
Charges
\$17,104

Post-Program
Charges
\$5,283

Savings/Patient
\$11,821

Treatment of heart failure account for 2% of total health care spending 51



Digital Home-Health



Profits vs. Free

Diabetes

- Appropriate disease management is critical

Pennsylvania Tele-home Project (171 patients)

Traditional Care
Per patient
\$232, 872

Remote Monitoring
Care per patient
\$87,327

Savings/Patient
\$145, 500

Traditional Care
Per patient
\$2,365

Remote Monitoring
Care per patient
\$1,668

Savings/Patient
\$697



Digital Home-Health



Profits vs. Free

- Current cost-benefit studies are limited in scope.
- Most studies are small and involve samples of between 30 to 450.
- Need more comprehensive and extensive studies of savings to patients/health care providers due to early detection of diseases as well as health maintenance.
 - *Medicare Health-Buddy program only half-way through 3 year pilot shows promise*



Digital Home-Health

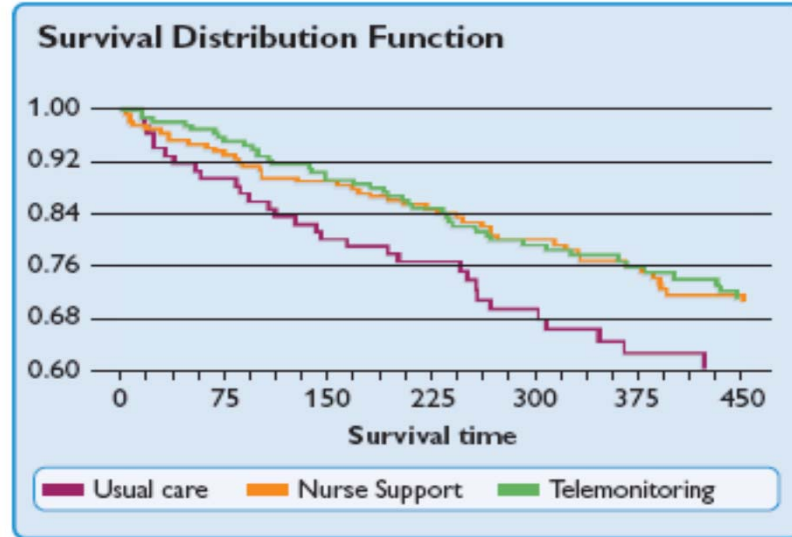


Entertainment vs. Efficiency

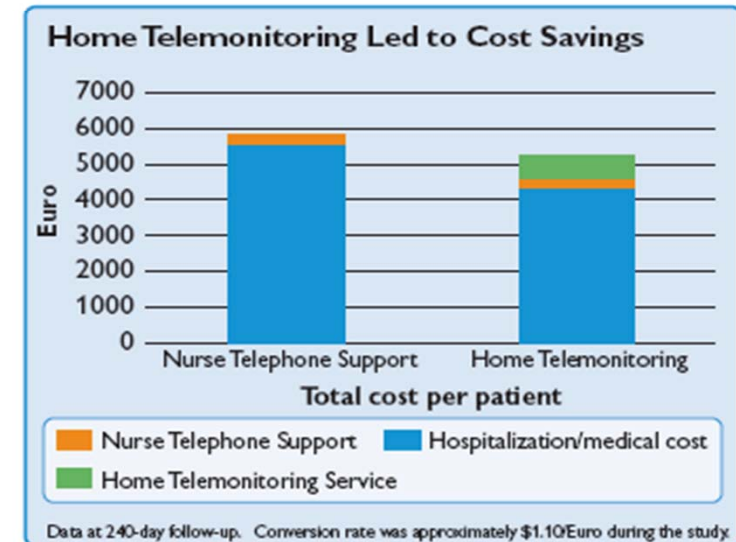
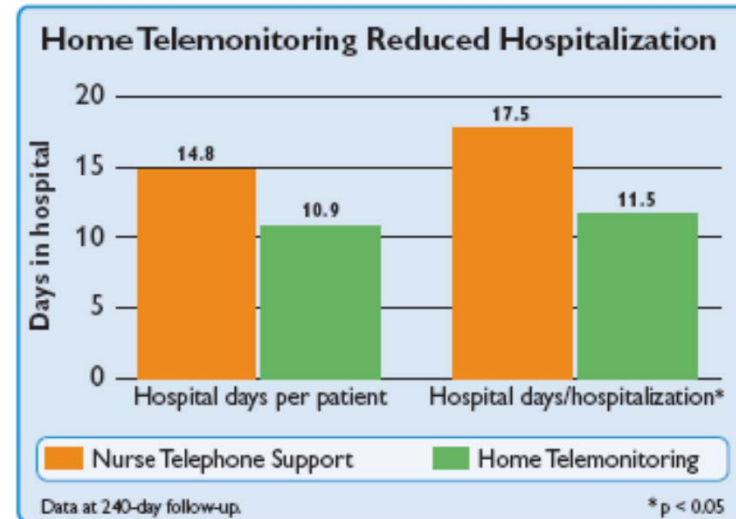
- Ease of use of devices and equipment still present some problems for the “average” physician.
- Interface devices generally have low compatibility to existing medical practices – health care professionals have to “adapt” to the devices and not vice-versa.
- Home-based interfaces still need to be developed.

Digital Home-Health Innovation vs. Cost-Effectiveness

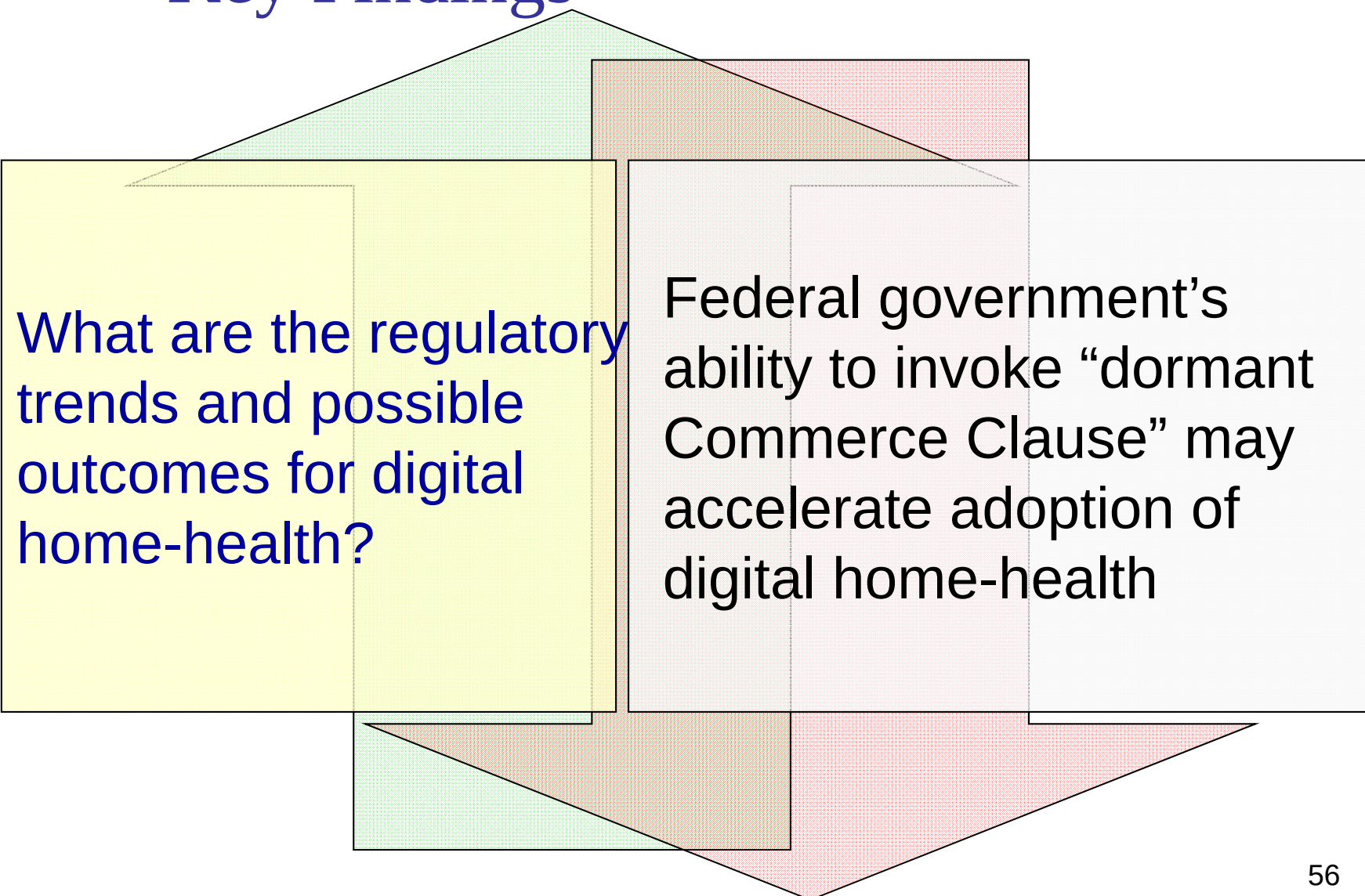
26% reduction in hospital days/patient



Survival rates for patients with congestive heart failure with home tele-monitoring and or nurse telephone support were substantially higher than in usual care



Key Findings



What are the regulatory trends and possible outcomes for digital home-health?

Federal government's ability to invoke "dormant Commerce Clause" may accelerate adoption of digital home-health



Digital Home-Health



Market vs. Regulation

- Multiple Federal regulatory agencies, up to twelve, have oversight on specific aspects (DEA, FDA, FCC, etc) of home-health
- States regulate health related issues within own borders. Multiple and different legal definitions between states.
- Telemedicine defined as “bringing doctor to the patient” as opposed to “patient to the doctor.”



Digital Home-Health



Profits vs. Free

- Potential comprehensive cost-savings at the Federal and State levels have not been fully established.
- Medicare has recently only begun re-imbursement for some services. In 2006, out of more than \$400 billion in total spending, only \$2 million on electronically conducted medical services
- Aetna Inc. and Cigna Corp has recently agreed to reimburse doctors for on-line visits.
- New comprehensive revenue and payments models need to be developed.



Summary Findings



Potential for digital home-health remains high but key constraints remain:

- Lack of comprehensive and extended studies to show cost-savings and economic benefits of digital home health.
- Multiple Federal and State agencies, up to twelve, with different legal mandate, regulate digital home-health and tele-health.
- Standards have to be developed to address interoperability issues across devices, software and protocols. – Role for major players.
- Absence of major OEMs exacerbate existence of multiple standards



Summary Findings

- User-interface should “adapt” to current medical practices and values – Microsoft and Google
- Need for better coordination between HMOs, State and Federal regulators and insurance companies.
- Reimbursement for most services must be accepted by insurers.



Conclusions



Prospects for Digital Home-health

- Rising health costs, aging population and shortage of clinical staff are accelerators to adoption
- Ability of Federal government to invoke Dormant Commerce Clause may accelerate adoption.
- Several insurers have begun to reimburse digital home-health services.



Summary Findings

Digital Home-Health

